1746

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FACSIMILE TRANSMISSION COVER SHEET

DATE: August 19, 2004

TO: Examiner Gentle E. WINTER
Group Art Unit 1746
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RE: U.S. Patent Application No. 09/825,582
For: METHODS OF MAKING CARBON FOAMS
Our Ref.: 00141 (3600-345)

FROM: Luke A. Kilyk, Esq.

FAC. TEL. NO.: 1-571-273-1310

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Items Attached: Letter to the Examiner -- 2 pages
Revised Appellant's Brief on Appeal – 26 pages
Appendix – 2 pages

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office, Fax No. 1-571-273-1310 on August 19, 2004.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: REZNEK, Steven R.	Examiner: Gentle E. WINTER
Application Number: 09/825,582	Group Art Unit: 1746
Filed: April 3, 2001	
Docket No.: 00141 (3600-345)	Confirmation No.: 9948

For: METHODS OF MAKING CARBON FOAMS

APPELLANT'S BRIEF ON APPEAL

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

August 19, 2004

Sir:

This is an appeal to the Board of Patent Appeals and Interferences (hereinafter, "the Board") from the Examiner's January 7, 2004 final Office Action rejecting claims 1-4, 7-14, and 17-29 in the above-identified application. The appealed claims and the rest of the pending claims are set forth in the attached Appendix.

I. THE REAL PARTIES IN INTEREST

The real party in interest, besides the named inventor, is Cabot Corporation.

II. RELATED APPEALS AND INTERFERENCES

No other appeal or interference which would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal is known to the appellant or the appellant's

legal representative.

III. STATUS OF CLAIMS

The claims pending in the application are claims 1-3, 7-14, and 17-29. Claims 30-34 were withdrawn due to a restriction requirement and an election of species requirement.[1]

In response to the restriction and election of species requirements dated June 4, 2003, the appellant elected with traverse the subject matter of Group I, encompassing claims 1-29 and 35 drawn to a method of making a carbon foam. Furthermore, the appellant, with regard to the election of species requirement, elected coal as the pyrolizable material, and natural gas was elected as the fuel source. Thus, claims 30-34 were withdrawn due to the restriction requirement. All of these elections were made with traverse.

In the same response, the appellant canceled claims 4 and 35 without disclaimer or prejudice of the subject matter.

In an Advisory Action dated April 16, 2004, the Examiner indicated that the Amendment dated January 7, 2004, was not entered and that claims 5, 6, 15, and 16 are also withdrawn; however, according to the Office Action dated June 4, 2003, these claims can be rejoined with claim 1, should claim 1 be deemed allowable.

A copy of the claims on appeal can be found in the attached Appendix.

IV. STATUS OF AMENDMENTS

In response to the final Office Action dated January 7, 2004, an Amendment dated April 7, 2004, was filed. The Examiner responded with an Advisory Action dated April 16, 2004,

[1] The final Office Action dated January 7, 2004 indicates that claim 4 is pending in the present application; however, the Examiner's indication is incorrect. In an Amendment dated October 3, 2003, the appellant canceled claim 4. Accordingly, although the Examiner's rejection discusses claim 4, the appellant makes no remarks with respect to claim 4.

wherein the Examiner indicated that the Amendment filed in response to the final Office Action would not be entered.

V. SUMMARY OF INVENTION

There is always a continuing effort to develop less expensive methods of making carbon foams, which preferably lead to greater flexibility in making foams having higher surface areas as well as high structure.

The disadvantage of the conventional methods of making carbon foams includes high costs, low surface areas, and low structure. (*See* e.g. page 2, lines 18-20 of the present application). The claimed invention, as discussed in detail below, leads to providing carbon foams at low cost, high surface area, and high structure. (*See* e.g., pages 2 and 3 of the present application). The claimed invention provides a carbon foam preferably by pyrolizing at least one pyrolizable material in the presence of a sufficient amount of at least one fuel source and at least one oxidizing source. The pyrolizable material or the products of the pyrolisis may provide the fuel source and/or a separate fuel source may be used. This carbon foam can then be used in its foam state or can be reduced into pieces of foam particles which preferably are highly structured. (*See* e.g., page 4 of the present application).

The carbon foam of the claimed invention can, if desired, be reduced to fragments and/or particles. The reduction of carbon foam can be achieved by any technique such as grinding the carbon foam into highly structured particles and/or fragments. The grounded carbon foam can be used as filler or any other use for carbon based particles. (*See* e.g. page 7 of the present application).

VI. ISSUES

The issues remaining for review by the Board of Patent Appeals and Interferences are:

A. The Examiner's rejection of claims 1-4, 7-14, and 17-29 under 35 U.S.C. §102(b) as being anticipated by Ullmann's Encyclopedia of Industrial Chemistry (hereinafter, Ullmann)

B. The Examiner's rejection of claims 1, 2, 4, 10, 12, and 21-28 under 35 U.S.C. §102(b) as being anticipated by Mayer et al. (U.S. Patent No. 5,908,896).

VII. GROUPING OF THE CLAIMS

As presently appealed, the groupings of the claims are as follows:

Claims 1, 3, 12, and 21 stand or fall together;

Claims 2 and 7-9 stand or fall together;

Claim 10 stands or falls on its own;

Claim 11 stands or falls on its own;

Claim 13 stands or falls on its own;

Claim 14 stands or falls on its own;

Claim 17 stands or falls on its own;

Claims 18-20 stand or fall together;

Claims 22 and 23 stand or fall together; and

Claims 24-29 stand or fall together.

VIII. ARGUMENTS

A. The Examiner's rejection of claims 1-4, 7-14, and 17-29 under 35 U.S.C. §102(b) as being anticipated by Ullmann's Encyclopedia of Industrial Chemistry (hereinafter, Ullmann).

1. The Examiner's Rejection

At page 2 of the final Office Action, the Examiner rejects claims 1-4, 7-14, and 17-29 under

35 U.S.C. §102(b) as being anticipated by Ullmann's Encyclopedia of Industrial Chemistry (hereinafter, Ullmann). The Examiner states that claims 1 and 10 of the present application recite, in part, a method of making carbon foam comprising pyrolizing a mixture in the presence of at least one oxidizing source. The Examiner asserts that carbon foam and activated carbon are equivalent and then asserts that Ullmann, at page 126, column 2, describes the formation of carbon foam (activated carbon), wherein the oxidizing source is disclosed as oxygen. With respect to claims 2-4 of the present application, the Examiner asserts that Ullmann also describes coal as the fuel source. With respect to claims 7-9 of the present application, the Examiner asserts that Ullmann, at page 128, section 4.2.3 describes that the fuel source is natural gas.

The Examiner also states that Ullmann, at page 127, section 4.2.1 describes the limitation of claims 18 and 19 of the present application. The Examiner also cites different parts of Ullmann to reject claims 11-14 and 17-29 of the present application.

Additionally, with respect to claims 1 and 10, the Examiner states that the appellant failed to distinguish the method of Ullmann from the claimed method. More specifically, the Examiner states that the appellant's argument that carbon foam includes cell structures (bubble like structures) within the carbon, whereas an activated carbon does not include cell structures, is more appropriately drawn to the foam than the method. The Examiner also asserts that Ullmann describes the method of the claimed invention. Therefore, the Examiner asserts that the appellant's argument that a different result is obtained from the method of the claimed invention, results in a lack of enablement rejection under 35 U.S.C. §112, first paragraph, for failure to disclose a critical step.

Additionally, at page 2 of the Office Action, the Examiner states that apparatus limitations in process claims, unless affecting the process in a manipulative sense, are accorded little or no patentability weight in process claims.

In the Advisory Action dated April 16, 2004, the Examiner states that the appellant argued that the oxidizing source used in the claimed invention is not taught in Ullmann. According to the Examiner, the appellant points to the specification, and argue that examples of the oxidizing component in the claimed invention are air, oxygen, or both. However, the Examiner states that the claims do not recite this limitation and it is improper to read limitations from the specification into the claims. Furthermore, the Examiner states that even if the claims did recite air, oxygen, or both, Ullmann describes, at page 128, column 1, and also in the Figures, "air or oxygen containing gases." In response to the appellant's argument that the air disclosed at page 125 is used for producing oxides during or after the activation process, the Examiner asserts that if air is supplied during the activation process, then the claim limitations, as argued to exist, are met.

With respect to the appellant's argument that the prior art of record, contextually, does not disclose combusting fuel, the Examiner states that this limitation is not in the claim. With respect to the appellant's argument that "oxygen or air is unsuitable as activating gases," again, the Examiner states that the claim and the art both disclose activating gases. The Examiner then asserts that at 800° C, "some of the carbonaceous starting material is decomposed." Therefore, the Examiner concludes that the appellant appears to get the same result with the same starting material and the same method steps.

With respect to the appellant's argument that the prior art of record fails to disclose a separate fuel and pyrolizable material, the Examiner asserts that Ullmann describes having a temperature of 800° C and that "some of the carbonaceous starting material is decomposed." The decomposition of the carbon in the presence of an oxidizing agent (even if it is steam) is an exothermic reaction. The Examiner then asserts that if the appellant's position was accepted, then the furnace at page 128 would be irrelevant (*see* page 128, column 2).

For the following reasons, the Examiner's rejection should be reversed.

2. The Appellant's Reply to the Examiner's rejection of claims 1-4, 7-14, and 17-29 under 35 U.S.C. §102(b) as being anticipated by Ullmann's Encyclopedia of Industrial Chemistry (hereinafter, Ullmann)

a) The patentability of claims 1, 3, 12, and 21.

As will be shown below, the Examiner's entire argument rests on the belief that activated carbon is the same as carbon foam and that the surface activation of carbon material to make the activated carbon, as that term is understood by those skilled in the art, would be the same as pyrolizing as recited in the appealed claims of the present application to make carbon foam. As further explained below, the activation of carbon to make activated carbon is not at all the same as pyrolizing a material to form carbon foam. In addition, the term "oxidizing source" is clearly described in the present application and understood by those skilled in the art with respect to the area of pyrolizing. One skilled in the art would clearly understand that "oxidizing source" is a source sufficient to at least partially combust the fuel that is present. *See*, for instance, page 4, lines 24-26 of the present application.

In terms of the claims at issue, the following summary is provided:

Claim 1 recites a method of making carbon foam comprising pyrolizing a mixture comprising at least one pyrolizable material in the presence of at least one oxidizing source and optionally at least one fuel source other than the pyrolizable material to form the carbon foam, wherein the pyrolizable material comprises coal, a carbohydrate, sugar, cellulose, or any combination thereof.

Claim 3 is dependent on claim 1, and recites that the pyrolizable material comprises coal.

Claim 12 is dependent on claim 1, and recites that the pyrolizable material, fuel source

when present, and oxidizing source are introduced sequentially in any order.

Claim 21 is dependent on claim 1, and recites that the pyrolizing occurs at a temperature of from about 300° C to about 1600° C.

Claim 1 of the present application recites, in part, a method of making carbon foam comprising pyrolizing a mixture comprising at least one pyrolizable material in the presence of at least one oxidizing source and optionally at least one fuel source other than the pyrolizable material. Furthermore, the present application, at page 4, lines 24-26, states that the oxidizing source is sufficient to at least partially combust the fuel, but the amount of oxidizing source should be controlled such that the pyrolizable material does not completely combust or burn. Accordingly, the purpose of the oxidizing source is to at least partially combust the fuel.

The process described in Ullmann significantly differs from the method of the claimed invention. For instance, the oxidizing source used in the claimed invention is not taught in Ullmann. According to the present application, at page 4, lines 18-20, examples of the oxidizing component in the claimed invention are air, oxygen, or both. *See* also claim 10. In contrast, Ullmann describes the use of gases containing combined oxygen, such as steam or carbon dioxide. Steam and carbon dioxide are incapable of combusting fuel, and therefore are not "oxidizing sources" as that term is used in claim 1. The term "combined oxygen" does not mean oxygen but a compound that contains oxygen, like H_2O or CO_2. Additionally, the air and water vapor described in Ullmann, at page 125, are not for pyrolizing a mixture including at least one pyrolizable material in the presence of air. The air and water vapor mentioned at page 125 of Ullmann are used to produce surface oxides during or after the activation process. It is important for the Board to appreciate that no pyrolizing is occurring when water vapor is used to produce surface oxides. Additionally, the air or oxygen containing gases mentioned at page 128 of

Ullmann are used to carry out a preoxidation step, which is usually carried out before gas activation. Again, no pyrolizing is occurring at this stage. Therefore, Ullmann does not teach or suggest "pyrolizing a mixture ...in the presence of at least one oxidizing source..." as recited in claim 1 of the present application. The purpose of the air or oxygen containing gases mentioned in Ullmann significantly differs from the purpose of the oxidizing source of the claimed invention.

Moreover, Ullmann, at page 124, defines activated carbon as a collective name for a group of porous carbons. Ullmann, at page 126, describes that to activate a carbon material by gas activation, gases containing combined oxygen, such as steam or carbon dioxide are used to produce fine pores or cracks. In order to produce the fine pores or cracks, the gases containing combined oxygen cannot be used to combust fuel. In fact, Ullmann confirms that the gases containing combined oxygen are not used to combust fuel by stating, at page 126, that the gases containing combined oxygen are steam or carbon dioxide, which are not capable of combusting fuel. In order to produce activated carbon, first, gases containing combined oxygen are introduced to carbon containing material. Then, the combination is heated, wherein the gases containing combined oxygen expand to produce fine pores or cracks. If the gases containing combined oxygen are used for combusting fuel, the oxygen would diminish and would no longer exist to be able to produce fine pores or cracks by expanding due to heat treatments. There are clear differences between the method of the claimed invention and the method described in Ullmann.

The Board's attention is also drawn to page 131 of Ullmann which further explains gas activation of carbonaceous material. As stated at page 131, column 1, underneath the heading "4.2.4.2 Gas Activation," gas activation occurs with suitable gases, the most common being

steam, carbon dioxide, or the mixtures of these two. Also, at page 131, column 2, the article further states that oxygen or air is unsuitable as activating gases. In fact, in the paragraph bridging pages 131 and 132, Ullmann states that air or oxygen can be used with acidic surface oxides but "below the ignition temperature." It is clear that in the formation of activated carbon, no pyrolizing is occurring and that there is a simple activation of the raw materials. It is respectfully pointed out that there is no mention whatsoever of pyrolizing occurring in Ullmann. The Examiner's reliance on page 126, column 2 of Ullmann to assert that an oxidizing source is disclosed as oxygen is not understood. Ullmann at page 126, column 2, clearly states that gases are "gases containing combined oxygen, such as steam or carbon dioxide." (Emphasis added). There is no mention of oxygen alone.

Thus, contrary to the Examiner's statements at page 4, paragraph 6 of the final Office Action, the appellant has shown a different process compared to Ullmann as set forth above and therefore, it is also clear that the product resulting from the process would be different. Ullmann clearly does not teach or suggest the claimed method or the resulting product and further, based on the above, there is no lack of enablement based on the Examiner's assumption that the methods are the same when in fact the methods as explained above are quite different.

With respect to claim 3, Ullmann clearly uses coal as the source to form the activated carbon and does not use the coal as a fuel source.

With respect to the Examiner's statement that in a case where a separate fuel is used, the amount of fuel is such that the fuel combustion consumes between 0 and 100% of the oxidizing material; therefore, if the fuel consumes 0% it is no longer a fuel, it is important for the Board to appreciate that when the fuel consumes 0% of the oxidizable material, since the oxidizing material is still present, the reaction would be an oxygen rich reaction.

With respect to claim 21 and the pyrolizing temperature, as indicated above, Ullmann does not teach pyrolizing. These temperatures mentioned in Ullmann are clearly with respect to gas activation to form extremely fine pores or cracks using steam or carbon dioxide. The presence of steam and carbon dioxide create a completely different environment than the environment set forth in claim 1 which is an outright pyrolizing of the material in the presence of at least one oxidizing source. Needless to say, the steam and carbon dioxide would hinder or prevent any pyrolizing.

With respect to the Examiner's comment that it is improper to read limitations from the specification into the claims and that even if the claims did recite air, oxygen, or both, Ullmann describes "air or oxygen containing gases," as the Board is well aware, it is proper to use the disclosure of the specification to shed light on the meaning of the claims. Clearly, the specification provides a definition of the term "oxidizing source." Moreover, see claim 10 on appeal. Furthermore, as the Board is well-aware, it is insufficient that the prior art merely mention the components of the patented method. The reference must be considered as a whole and the cited reference must teach or suggest the use of the components in the same manner as recited in the claimed invention. As stated above, the air and oxygen containing gases mentioned at page 128 of Ullmann are used to carry out a pre-oxidation step, which is usually carried out before gas activation. Therefore, Ullmann does not teach or suggest "pyrolizing a mixture . . . in the presence of at least one oxidizing source . . ." as recited in claim 1 of the present application. The purpose of the air and oxygen containing gases mentioned in Ullmann significantly differs from the purpose of the oxidizing source of the claimed invention. A simple mentioning of air or oxygen containing gases in Ullmann does not make the claimed invention anticipated.

With respect to the Examiner's argument that the claims and the prior art both disclose activating gases, as stated earlier, the reference must be considered as a whole. As argued above, Ullmann, at page 131, column 2, states that oxygen or air is undesirable as activating gases. In fact, at the bottom of page 131 and continuing onto page 132, Ullmann even states that air or oxygen can be used with acidic surface oxides, but "below the ignition temperature." Therefore, it is clear that in the formation of the activated carbon, no pyrolization occurs and that there is a simple activation of raw materials. Furthermore, Ullmann, at page 126, column 2, states that gases are "gases containing combined oxygen, such as steam or carbon dioxide." No mention of oxygen alone exists in Ullmann.

Accordingly, this rejection should be reversed.

b) The patentability of claims 2 and 7-9.

Claim 2 is dependent on claim 1, and recites that the at least one fuel source is present.

Claim 7 is dependent on claim 2, and recites that the fuel source is a liquid or gas or combination thereof.

Claim 8 is dependent on claim 2, and recites that the fuel source is natural gas.

Claim 9 is dependent on claim 2, and recites that the fuel source is a hydrocarbon containing material.

The arguments set forth above with respect to the patentability of claim 1 apply equally here and are incorporated in their entirety by reference herein.

Claim 2 of the present application requires the presence of a pyrolizable material as well as a separate fuel source. There is no mention in the claims that the pyrolizable material and the fuel source are the same and in fact, if this was the case, claim 2 would be redundant, which it is not. Clearly, a separate pyrolizable material must be present as well as a separate fuel source

based on a reading of claim 2. Ullmann does not teach or suggest a fuel source separate from at least one pyrolizable material.

Clearly three components are mentioned in the process of claim 2, namely, a pyrolizing material, an oxidizing source, and a fuel source. If one takes the Examiner's position that the coal of Ullmann is the fuel source, then Ullmann does not disclose a pyrolizable material. Further, if one takes the Examiner's position that the pyrolizable material of Ullmann is coal, then there is no fuel source disclosed in Ullmann. Clearly, one component is missing no matter what position the Examiner takes with respect to Ullmann and the use of fuel source. This similarly applies to the Examiner's position taken with respect to claims 7-9. Therefore, Ullmann cannot possibly anticipate the subject matter of claims 2 and 7-9.

Accordingly, this rejection should be reversed.

c) The patentability of claim 10.

Claim 10 is dependent on claim 1, and recites that the oxidizing source is air, oxygen, or both.

The arguments set forth above with respect to the patentability of claim 1 apply equally here and are incorporated in their entirety by reference herein.

Claim 10 specifically recites that the air, oxygen, or both are the oxidizing source during pyrolizing. So, the question to ask is, does Ullmann specifically teach pyrolizing in the presence of air, oxygen, or both? The answer is no.

As stated earlier, Ullmann teaches away from an oxidizing source that is air, oxygen, or both. Ullmann describes the use of gases containing combined oxygen, such as steam or carbon dioxide. However, steam and carbon dioxide are incapable of combusting fuel, and therefore are not the "oxidizing sources" recited in claim 10 of the present application. The term "combined

oxygen" in Ullmann does not mean oxygen but a compound that contains oxygen, such as H_2O or CO_2. Ullmann makes this very clear. Additionally, as stated earlier, the air and water vapor described in Ullmann, at page 125, are not for pyrolizing a mixture including at least one pyrolizable material in the presence of air. The air and water vapor mentioned at page 125 of Ullmann are used to produce surface oxides during or after the activation process. No pyrolizing is occurring at this stage. Additionally, the air or oxygen containing gases mentioned at page 128 of Ullmann are used to carry out a preoxidation step, which is usually carried out before gas activation. Again, no pyrolizing is occurring at this stage.

Also, at page 131, column 2, the article further states that oxygen or air is unsuitable as activating gases. In fact, at the bottom of page 131 and continuing onto page 132, Ullmann even states that air or oxygen can be used with acidic surface oxides but "below the ignition temperature." Therefore, Ullmann does not teach or suggest an oxidizing source for pyrolizing that is air, oxygen, or both as recited in claim 10 of the present application.

Accordingly, this rejection should be reversed.

d) The patentability of claim 11.

Claim 11 is dependent on claim 1, and recites that the oxidizing material is present in an amount which is between 0.05 and 0.75 of the amount needed to combust completely the pyrolizable material and fuel; and the fuel is present in an amount such that its complete combustion consumes between 0 and 100 % of the oxidizable material.

The arguments set forth above with respect to the patentability of claims 1 and 2 apply equally here and are incorporated in their entirety by reference herein.

The Examiner relies on Figure 21 to reject this claim. However, Figure 21 of Ullmann simply illustrates carbon, oxygen, and hydrogen contents present in bituminous coals. Again,

Ullmann does not teach or suggest pyrolizing with any oxidizing source at any level. Further, these ingredients (that the Examiner relies on to reject the claims) are present in the coal itself and are not separate from the coal. Furthermore, the Examiner apparently takes the position that the oxygen present in the coal itself would serve as the oxygen for purposes of the amount of oxidizing material present with the pyrolizable material and fuel as recited in claim 11. However, again, claim 11, which is dependent on claim 1, clearly recites the presence of an oxidizing material which is separate from a pyrolizable material and when the fuel is present, a fuel source that is separate from the pyrolizable material as well as the oxidizing material. The Examiner's reliance on the chemical makeup of coal to support the presence of the oxidizing material or fuel source would not be a proper rejection. Claim 11, as well as claim 1 as explained above, clearly requires the presence of separate components. The oxygen, hydrogen, and carbon ratio set forth in Fig. 21 is with respect to the actual chemical makeup of coal. These are not separate components but are the chemical makeup of coal. Therefore, it is clear that Fig. 21 does not support the presence of a separate oxidizing material in these ratios since the material referred to in Fig. 21 is the coal itself which the Examiner has previously acknowledged as the pyrolizable material for purposes of relying on Ullmann. Therefore, Fig. 21 does not teach the amount of the separate oxidizing material as recited in claim 11 of the present application.

Accordingly, this rejection should be reversed.

e) The patentability of claim 13.

Claim 13 is dependent on claim 1, and recites that the pyrolizable material, fuel source, and oxidizing source are added as a mixture.

The arguments set forth above with respect to the patentability of claims 1 and 2 apply equally here and are incorporated in their entirety by reference herein.

According to the Examiner, claim 13 would be anticipated since Ullmann indicates that activated carbon includes not only carbon but also small amounts of oxygen and hydrogen. However, the Examiner is taking the reading of Ullmann out of context. Ullmann, at page 125, first column, clearly indicates that activated carbon is carbon and oxygen and hydrogen, which are chemically bonded in the form of various functional groups. All of these components actually make up the activated carbon. Again, the Examiner cannot take the position that the activated carbon serves as the pyrolizable material as well as the fuel source at the same time. Claim 13 clearly recites three separate components that are added as a mixture and clearly Ullmann at page 125, column 1, does not disclose any such mixture. The language relied upon by the Examiner clearly indicates that the oxygen and hydrogen are absolutely part of the activated carbon.

Given that Ullmann does not teach or suggest a separate pyrolizable material, fuel source, and oxidizing source, as explained above, Ullmann cannot possibly anticipate claim 13. It is respectfully pointed out that the chemical makeup of activated carbon can not be used to teach a separate fuel source or separate oxidizing source.

Accordingly, this rejection should be reversed.

f) The patentability of claim 14.

Claim 14 is dependent on claim 1, and recites that at least one pyrolizable material is introduced into a combustion chamber by being dispersed in said fuel source when present or the oxidizing source or both.

The arguments set forth above with respect to the patentability of claims 1 and 2 apply equally here and are incorporated in their entirety by reference herein.

Further, Ullmann simply does not teach or suggest a pyrolizable material being dispersed in any fuel source or an oxidizing source. Again, the Examiner cannot take the position that the

pyrolizable material serves as two components when in fact it is only one component. Claim 14 clearly recites two or three components.

Accordingly, this rejection should be reversed.

g) The patentability of claim 17.

Claim 17 is dependent on claim 2, and recites that the fuel source and the oxidizing source are introduced into a combustion chamber prior to the introduction of at least one pyrolizable material and wherein the fuel source and oxidizing source are ignited prior to introducing the at least one pyrolizable material into the chamber.

The arguments set forth above with respect to the patentability of claim 2 apply equally here and are incorporated in their entirety by reference herein.

The Examiner relies on Fig. 23 of Ullmann to reject claim 17. With respect to claim 17, Ullmann does not teach the fuel source or oxidizing source being introduced into the combustion chamber prior to the introduction of at least one pyrolizable material. Looking at Fig. 23, one cannot tell which ingredient is introduced into the furnace first other than seeing where the outlets are located. The location of the outlets does not indicate where or when the injection of the ingredients is occurring.

Furthermore, Fig. 23 makes no mention or illustration of any pyrolizing occurring in the rotary kiln. As indicated throughout the article of Ullmann, and with respect to the discussion of Fig. 23, the gas and air are used in the kiln for gas activation with the use of the steam. Gas activation does not involve pyrolization. As previously indicated, gas activation does not result in pyrolizing, but simply is used to form a porous structure by forming cracks. As also stated in Ullmann, at page 131, second column, oxygen and air are not suitable as activating gases and therefore it is clear that these materials are simply used to achieve a suitable temperature in order

for steam to activate the coal and nothing more.

Accordingly, this rejection should be reversed.

h) The patentability of claims 18-20.

Claim 18 is dependent on claim 1, and recites that at least pyrolizable material is introduced by being dispersed in a carrier stream.

Claim 19 is dependent on claim 18, and recites that the carrier stream is an inert gas.

Claim 20 is dependent on claim 18, and recites that the carrier gas is a fuel source or an oxidizing source or both.

The arguments set forth above with respect to the patentability of claims 1 and 2 apply equally here and are incorporated in their entirety by reference herein.

With respect to claims 18 and 19, the appellants cannot locate the discussion of the need for an inert environment set forth at page 126 of Ullmann as argued by the Examiner. The appellants pointed this out in replying to the final Office Action, but received no further information from the Examiner. Nonetheless, Ullmann does not teach introducing any pyrolizable material by being dispersed in a carrier stream of any sort, and especially an inert gas carrier stream.

With respect to the Examiner's rejection of claims 19 and 20, an "oxygen free gas" does not mean an inert gas. Furthermore, it is not clear if the Examiner intended to assert that Ullmann discloses an "oxygen free gas" in section 4.2.5 at page 132, since this term does not appear to exist in this section. However, it is recognized that Ullmann mentions suitable gases such as halogens, but it is respectfully pointed out that this reference is clearly with respect to converting the iron into volatile compounds by treating the carbon while it is still hot with gases and has nothing to do with the formation of the activated carbon. Furthermore, the mention of other gases

in section 4.2.5 relate to gases used for a 2-stage activation process. Again, this has nothing to do with using such a gas as a carrier stream. In addition, with respect to claim 20, wherein the carrier gas is a fuel source or an oxidizing source, or both, it is respectfully pointed out, as indicated above, that an "oxygen containing gas" as described in Ullmann is not a fuel source or an oxidizing source but would be steam or carbon dioxide.

Furthermore, with respect to the Examiner's assertion that section 4.2.4.2 shows a carrier gas, the appellant respectfully disagrees. The "mild oxidizing agent" set forth in this section is clearly with reference to steam or carbon dioxide which is not used as a carrier gas, but is clearly used only as an activation gas to form the cracks in the activated carbon. There is no mention in this paragraph of actually using the steam or carbon dioxide as a carrier gas.

Accordingly, this rejection should be reversed.

i) The patentability of claims 22 and 23.

Claim 22 is dependent on claim 1, and recites a carbon foam formed by the method of claim 1.

Claim 23 is dependent on claim 2, and recites a carbon foam formed by the method of claim 2.

The arguments set forth above with respect to the patentability of claims 1 and 2 apply equally here and are incorporated in their entirety by reference herein.

As pointed out above, the process of the claimed invention is quite different from Ullmann, and clearly a different product would result. Furthermore, a carbon foam is clearly different from activated carbon.

Accordingly, this rejection should be reversed.

j) The patentability of claims 24-29.

Claim 24 is dependent on claim 22, and recites that the carbon foam has cells bordered by thin sheets, windows, struts, or combinations thereof.

Claim 25 is dependent on claim 23, and recites that the carbon foam has cells bordered by thin sheets, windows, struts, or combinations thereof.[2]

Claim 26 is dependent on claim 22, and recites that the cells have openings between them.

Claim 27 is dependent on claim 22, and recites that the carbon foam is rigid.

Claim 28 is dependent on claim 22, and recites a thermal insulating material comprising the carbon foam of claim 22.

Claim 29 is dependent on claim 22, and recites a polymer compound that comprises the carbon foam of claim 22, or fragments thereof.

The arguments set forth above with respect to the patentability of claims 22 and 23 apply equally here and are incorporated in their entirety by reference herein. Moreover, no where in Ullmann is there any mention of a carbon foam having cells bordered by thin sheets, windows, or struts, or combinations thereof. At best, Ullmann teaches the making of activated carbon, which is not carbon foam and which has pores formed on the surface. This is very different from carbon foam having cells. Clearly, one skilled in the art would not consider the formation of pores on the surface of activated carbon to be the same as carbon foam having cells bordered by thin sheets, windows, struts, or combinations thereof.

With respect to claims 24 and 25, there is no mention at all in Ullmann, even at page 131,

[2] In addition, the appellants note that claims 24 and 25 contain a typographical error wherein "carbon form" should read "carbon foam." Also, claim 26 should be dependent on claim 24. These simple typographical errors were attempted to be corrected in the response to the final Office Action. Unfortunately, the Examiner was not willing to enter this amendment for reasons not fully understood by the appellant.

with respect to carbon foam having cells especially cells bordered by thin sheets, windows, struts, or combinations thereof. As clearly indicated in Ullmann, activated carbon at best forms cracks and fissures which are called pores which are cylindrical in shape for the most part. This clearly is not the same as a carbon foam product having cells.

Furthermore, with respect to the Examiner's reliance at page 131, column 2, last full paragraph of Ullmann, there is no mention of a foam structure or the presence of cells bordered by thin sheets, windows, struts, or combinations thereof. This paragraph specifically states that oxygen reacts too fast and by doing so would lead to uncontrollable combustion without producing activation. In the alternative, oxygen can lead to activated material with very large pores. Again, pores are not cells but are cracks in the surface of the activated carbon as clearly mentioned at page 126, last paragraph, second column. In addition, the same comments apply to claim 27.

With respect to claims 28 and 29, there is no mention of the thermal insulating material or polymer compounds in Ullmann. Clearly, activated carbon is not used as a thermal insulating material. At the very least, no reference has been shown to support such an assertion. In addition, with respect to the Examiner's argument that a mineral oil would suffice for purposes of showing a polymer compound, the appellant is unaware of any one characterizing a mineral oil as a polymeric compound when present with activated carbon. Mineral oil is not a polymeric compound. Certainly, at page 132, last paragraph, there is no characterization of the mineral oil with the activated carbon being considered a polymer compound.

Accordingly, this rejection should be reversed.

B. The Examiner's rejection of claims 1, 2, 4, 10, 12, and 21-28 under 35 U.S.C. §102(b) as being anticipated by Mayer et al. (U.S. Patent No. 5,908,896).

1. The Examiner's rejection

At page 9 of the final Office Action, the Examiner rejects claims 1, 2, 4, 10, 12, and 21-28 under 35 U.S.C. §102(b) as being anticipated by Mayer et al. (U.S. Patent No. 5,908,896).

According to the Examiner, Mayer et al., in claim 5, describes pyrolizing a pyrolizable material in an oxidizing atmosphere. The Examiner also asserts that the limitation of having at least one fuel source, other than the pyrolizable material, is met when the pyrolizable material of Mayer et al. is heated between 500-3000°C, and CO along with other volatiles are vaporized. The Examiner further asserts that Mayer et al. describes an "organic" microsphere as the pyrolizable substance.

The Examiner also cites various sections of Mayer et al. to reject claims 10, 12, and 21 of the present application.

With respect to claims 22 and 23 of the present application, the Examiner's assumes that the method of the claimed invention is identical to the method described in Mayer et al.; therefore, the Examiner concludes that Mayer et al. and the claimed invention will inherently form the same product.

The Examiner also makes other assumptions to reject claims 24-28 of the present application.

Additionally, at page 3 of the final Office Action, the Examiner states that claim 1 does not require a fuel, since it is an optional component. Furthermore, the Examiner states that the appellant did not advance arguments that the Examiner's assumption that the method of the claimed invention will inherently form the same product is flawed. Additionally, the Examiner states that if the same method steps produce a different result, then the claims of the present application can be rejected under 35 U.S.C. §112, first paragraph.

For the following reasons, the Examiner's rejection should be reversed.

2. The Appellant's Reply to the Examiner's rejection of claims 1, 2, 4, 10, 12, and 21-28 under 35 U.S.C. §102(b) as being anticipated by Mayer et al. (U.S. Patent No. 5,908,896).

a) The patentability of claims 1, 12, and 21.

Mayer et al. relates to organic aerogel microspheres which can be used in capacitors, batteries, thermal insulation, adsorptions/filtration media, and chromatographic packing. According to Mayer et al., the microspheres can be pyrolized to form carbon aerogel microspheres. Mayer et al. does not teach or suggest any source of fuel. More importantly, with respect to claim 1 of the present application, Mayer et al. does not teach or suggest a pyrolizable material that includes coal, carbohydrate, sugar, cellulose, or combinations thereof. The Examiner's rejection of claim 1 and the claims dependent thereon is not fully understood. Mayer et al. does not teach or suggest the specific pyrolizable material recited in the method of claim 1. The Examiner has not explained nor addressed this limitation in the Office Action. Claims 12 and 21 are directly dependent on claim 1. Therefore, the reasons set forth above, with respect to the patentability of claim 1 would also apply equally here. Accordingly, this rejection should be reversed.

b) The patentability of claim 2.

Claim 2 is dependent on claim 1, and recites that at least one fuel source is present.

The arguments set forth above with respect to the patentability of claim 1 apply equally here and are incorporated in their entirety by reference herein.

Mayer et al. does not teach or suggest any source of fuel. Furthermore, Mayer et al. does not teach a pyrolizable material that includes coal, carbohydrates, sugar, cellulose, or

combinations thereof.

Accordingly, this rejection should be reversed.

c) The patentability of claim 10.

Claim 10 is dependent on claim 1, and recites that the oxidizing source is air, oxygen, or both.

The arguments set forth above with respect to the patentability of claim 1 apply equally here and are incorporated in their entirety by reference herein.

Mayer et al. does not teach or suggest that the specific pyrolizable material is coal, carbohydrates, sugar, cellulose, or combinations thereof. Accordingly, this rejection should be reversed.

d) The patentability of claim 22 and 23.

Claim 22 is dependent on claim 1, and recites a carbon foam formed by the method of claim 1.

Claim 23 is dependent on claim 2, and recites a carbon foam formed by the method of claim 2.

The arguments set forth above with respect to the patentability of claims 1 and 2 apply equally here and are incorporated in their entirety by reference herein.

With respect to claims 22 and 23, the Examiner asserts that since the method has the same steps, the same product will inherently result. However, the appellant respectfully disagrees. As stated above, Mayer et al. does not use the same process. Mayer et al. clearly does not teach or suggest pyrolizing using the pyrolizing material set forth in claim 1. Since the process steps are clearly different, the Examiner's assumptions are incorrect and clearly a different product would result since a different pyrolizing is occurring. It again must be

remembered that Mayer et al. specifically states, as acknowledged by the Examiner, that the organic aerogel microsphere is pyrolized. The pyrolizable material set forth in claim 1 of the present application in no way relates to an organic aerogel microsphere. Clearly, the process is different and the result is different.

Accordingly, this rejection should be reversed.

e) The patentability of claims 24-28.

Claim 24 is dependent on claim 22, and recites the carbon foam has cells bordered by thin sheets, windows, struts, or combinations thereof.

Claim 25 is dependent on claim 23, and recites the carbon foam has cells bordered by thin sheets, windows, struts, or combinations thereof.

Claim 26 is dependent on claim 22, and recites that the cells have openings between them.

Claim 27 is dependent on claim 22, and recites that the carbon foam is rigid.

Claim 28 is dependent on claim 22, and recites a thermal insulating material comprising the carbon foam of claim 22.

Claim 29 is dependent on claim 22, and recites that the polymer compound comprising the carbon foam of claim 22, or fragments thereof.

The arguments set forth above with respect to the patentability of claims 22 and 23 apply equally here and are incorporated in their entirety by reference herein.

Mayer et al. does not teach or suggest carbon foam having cells bordered by thin sheets, windows, struts, or combinations thereof as recited in claims 24 and 25 of the present application. Moreover, the carbon foam of the present invention is pyrolized from completely different material so the carbon foam having the cells would also be different. Furthermore,

there is no discussion in Mayer et al. regarding cells having openings between them or that the carbon foam is rigid. In addition, claims 24-29 are dependent on claims 22 or 23. Therefore, claims 24-29 would equally be different for the reasons set forth above with respect to the patentability of claims 22 and 23. Accordingly, this rejection should be reversed.

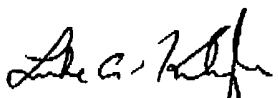
IX. CONCLUSION

For at least the reasons discussed above, it is respectfully submitted that all of the Examiner's rejections of the pending claims are in error and should be reversed.

If there is any other fee due in connection with the filing of this Brief on Appeal, please charge the fee to Deposit Account No. 03-0060.

Respectfully submitted,

Kilyk & Bowersox, P.L.L.C.



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APPENDIX

1. A method of making carbon foam comprising pyrolizing a mixture comprising at least one pyrolizable material in the presence of at least one oxidizing source and optionally at least one fuel source other than said pyrolizable material to form said carbon foam, wherein said pyrolizable material comprises coal, a carbohydrate, sugar, cellulose, or any combination thereof.

2. The method of claim 1, wherein said at least one fuel source is present.

3. The method of claim 1, wherein said pyrolizable material comprises coal.

7. The method of claim 2, wherein said fuel source is a liquid or gas or combination thereof.

8. The method of claim 2, wherein said fuel source is natural gas.

9. The method of claim 2, wherein said fuel source is a hydrocarbon containing material.

10. The method of claim 1, wherein said oxidizing source is air, oxygen, or both.

11. The method of claim 1, wherein said oxidizing material is present in an amount which is between 0.05 and 0.75 of the amount needed to combust completely the pyrolizable material and fuel; and the fuel is present in an amount such that its complete combustion consumes between 0 and 100 % of the oxidizable material.

12. The method of claim 1, wherein said pyrolizable material, fuel source when present, and oxidizing source are introduced sequentially in any order.

13. The method of claim 1, wherein said pyrolizable material, fuel source, and oxidizing source are added as a mixture.

14. The method of claim 1, wherein said at least one pyrolizable material is introduced into a combustion chamber by being dispersed in said fuel source when present or

said oxidizing source or both.

17. The method of claim 2, wherein said fuel source and said oxidizing source are introduced into a combustion chamber prior the introduction of at least one pyrolizable material and wherein said fuel source and oxidizing source are ignited prior to introducing said at least one pyrolizable material into said chamber.

18. The method of claim 1, wherein said at least pyrolizable material is introduced by being dispersed in a carrier stream.

19. The method of claim 18, wherein said carrier stream is an inert gas.

20. The method of claim 18, wherein said carrier gas is a fuel source or an oxidizing source or both.

21. The method of claim 1, wherein said pyrolizing occurs at a temperature of from about 300° C to about 1600° C.

22. Carbon foam formed by the method of claim 1.

23. Carbon foam formed by the method of claim 2.

24. The carbon foam of claim 22, said carbon form having cells bordered by thin sheets, windows, struts, or combinations thereof.

25. The carbon foam of claim 23, said carbon form having cells bordered by thin sheets, windows, struts, or combinations thereof.

26. The carbon foam of claim 22, wherein said cells have openings between them.

27. The carbon foam of claim 22, wherein said carbon foam is rigid.

28. A thermal insulating material comprising the carbon foam of claim 22.

29. A polymer compound comprising the carbon foam of claim 22, or fragments thereof.